STATE OF CALIFORNIA
Department of General Services - Office of Procurement
PURCHASE ORDER

Form GSOP 1-PIN (04/98)

Purchase Order No.	Rev.	Date
62199		6/30/2008

Supplier No.	Solicitation No.	Delivery Date	FOB Point	Invoice Terms
335436	56984	120 Days ARO	Destination	

TELEDYNE ADVANCED
INSTRUMENTATION, INC.
9480 CARROLL PARK DRIVE
SAN DIEGO, CA 92121-5201
Attn: MELANIE L. DANNER

Phone: 858-657-9800

Ship To
AIR RESOURCES BOARD
1927 13TH ST
SACRAMENTO CA 95811
Attn: REGGIE SMITH

Charge To
AIR RESOURCES BOARD
PO BOX 1436
ATT:ACCTING 916-327-0631
SACRAMENTO CA 95812

Agency Billing	Agency Purchase Estimate	Purchase Estimate	Revision
64500	PE075001	67159	1

Agency Contact	Phone	Date Received
LYNN PILE	916-327-5754	

Item No.	Quantity	Unit	Commodity Code	Description	Unit Price	Extension
				THE GENERAL PROVISIONS FOR NON-IT COMMODITIES ARE HEREBY INCORPORATED BY REFERENCE. THESE GENERAL PROVISIONS CAN BE OBTAINED BY PHONING (916) 375-4400 OR BY ACCESSING OUR WEBSITE AT: www.documents.dgs.ca.gov/pd/modellang/GPnonIT0407.pdf		
				THE FOLLOWING INFORMATION IS PROVIDED FOR AGENCY USE ONLY: PRIME CONTRACTOR: NS		
1	17	EA	4910-000-0006-8	EMISSION ANALYZER Total Oxides of Nitrogen Analyzer shall be furnished in accordance attached Bid Specification #6620-0119 of (5) five pages dated, June 10, 2008. Brand: TELEDYNE API Model: 200E	7,055.4000	119,941.80
				Total Value:		119,941.80

FOB DESTINATION:

For the purpose of this order, only F.O.B. Destination will be accepted.

This purchase order is being awarded on September 25, 2008 pursuant to Government Code Section 13332.17. Any encumbrances made pursuant to this purchase order shall be construed to have been made on the last day of the preceding fiscal year.

Sales and/or use tax to be extra unless noted above

Buyer	Phone	BOC Number
GUS QUINTERO	916-375-4499	

STATE OF CALIFORNIA

Department of General Services - Office of Procurement

PURCHASE ORDER CONTINUATION

Form GSOP 2-PIN (04/98)

Purchase Order No.	*Revision*	*Date*	*Supplier No.*	*Supplier Name*
62199		6/30/2008	335436	TELEDYNE ADVANCED

Item No.	*Quantity*	*Unit*	*Commodity Code*	*Description*	*Unit Price*	*Extension*

This Purchase order has been registered into the state contact and procurement registration system (https://www.scprs.dgs.ca.gov/). The registration number is 39000908334368.

CHANGE ORDERS:

This Purchase Order may be amended, modified or terminated at any time by mutual agreement of the parties in writing. Change orders amending, modifying or terminating the Purchase Order, including any modifications of the compensation payable, may be issued only by the State Procurement Officer. All such change orders shall be in writing and issued only upon written concurrence of the supplier. Termination, as that term is used in this section, does not include termination for default of the supplier.

These specifications describe the minimum acceptable quality and/or performance level of the equipment to be purchased. Superior alternatives will be considered as compliant to the specifications. Unless otherwise defined in these specifications, technical terms and testing procedures shall be interpreted as defined in Title 40 of the Code of Federal Regulations (CFR), Part 53.23.

A. GENERAL SPECIFICATIONS

1. Equipment Description - Each Oxides of Nitrogen (NOx) analyzer shall continuously monitor concentrations of NOx, NO_2, and NO in ambient air using the chemiluminescence analysis technique.

2. EPA Designation - Each analyzer must be designated as a reference or equivalent method for the measurement of concentrations of Oxides of Nitrogen (NOx) in ambient air by the United States Environmental Protection Agency (U.S. EPA) as defined in 40 CFR Part 53. Each analyzer shall meet all performance specifications listed herein while operating in the equivalent mode as approved by the US-EPA.

B. PHYSICAL SPECIFICATIONS

1. Each analyzer shall be modular in design fully enclosed in a metal cabinet, allowing for easy access for servicing. It shall be supplied with all the hardware, including slides and brackets, necessary for mounting in a 19" wide by 25" deep instrument rack. Telescoping slides must provide a safety-locking device to hold empty rails in-place during installation to prevent personnel injuries and damage to the analyzer.

2. The total weight of each analyzer shall not exceed 60 pounds.

3. The A.C. input power cord shall be 3 conductor and at least 6 feet in length with a standard 3-prong grounded plug. The A.C. input to each analyzer shall be at the rear of each analyzer. The connectors shall be wired so that the "hot" terminal (black wire) is connected to the brass terminal throughout. The supply voltage shall be nominal, 115 ± 10 VAC, 60 ± 3 Hz, single phase.

4. The front panel of each analyzer shall include all the controls necessary to operate and calibrate the analyzer.

5. The analog output voltage proportional to the ambient concentration of NO, NO_2 and NOx shall be accessible at the rear of each analyzer.

6. Each analyzer shall have a digital read-out on the front panel that has the capability to continuously display the current concentration of NO, NO_2 or NOx in the ambient air.

7. The digital readout on the front panel of each analyzer shall have the capability to display the flow rate through the ozone generator and the flow rate of the ambient air sample through the analyzer.

8. All tubing in each analyzer shall have connections, controls and fittings that are designed for rapid, easy and repeated disassembly and reassembly as may be required for cleaning and repair. All tubing, connections, fittings and controls shall be constructed of materials which will not react with atmospheric or higher concentrations of NO, NO_2, O_3, or hydrocarbons. External sample port and exhaust bulkhead fittings must be stainless steel 1/4 inch Swagelock, Parker or equivalent. The materials, design, and construction of tube fittings shall be such that no leaks will develop as a result of repeated disassembly and reassembly. All gas handling systems and components shall be free of leaks.

9. Each analyzer shall have separate analog voltage outputs for nitric oxide (NO), nitrogen dioxide (NO_2) and total oxides of nitrogen (NOx). Analog output voltages must have capability to be output at 0-1.0 Volt DC. Readings shall be continuously available; proportional to the concentration of the gas being measured.

10. Each analyzer shall be equipped with a permeation dryer to provide dry air to the ozone generator.

11. Each analyzer shall be equipped with a temperature sensor to enable automatic continuous temperature correction.

12. Each analyzer shall have the capability to sense pressure changes across the reaction chamber and to compensate accordingly and maintain the pre-set reaction chamber vacuum automatically regardless of change in atmospheric pressure or pump vacuum.

13. Each analyzer shall be microprocessor controlled.

14. Each analyzer shall be equipped with a replaceable molybdenum converter cartridge.

15. Each analyzer shall have U.S. EPA approved time constant settings selectable from 10 to 300 seconds.

16. Each analyzer shall display a label or sticker indicating the reference designation number assigned by U.S. EPA to show that the instrument is acceptable for use in air quality surveillance systems by U.S. EPA.

17. All components in each analyzer shall be mounted so that they can be easily and quickly serviced, removed and reinstalled. All units and sub units shall be interchangeable and shall be of modular construction. All modules shall be capable of replacement with maximum service of 30 minutes using only screwdrivers and/or crescent wrenches.

18. Each analyzer shall be equipped with a pump that must maintain the operating vacuum to within ± 0.5 inch of mercury while operating 24 hours a day for 24 months. The pump shall operate without being damaged by ozone. Standard manufacture's warranty and proper maintenance procedures for the pump as outlined in the O&M manual should be followed for pump life. Technological improvements in the components of the pump virtually assure little if any damage to it.

19. Each analyzer shall be equipped with a scrubber to remove ammonia (NH_3) from the sample stream.

C. PERFORMANCE SPECIFICATIONS

1. The full-scale range of each analyzer shall be selectable from 50 ppb to 20 ppm. Each analyzer shall be U.S. EPA approved for operation on the 0-50, 0-100, 0-200, 0-500 ppb and the 0-1 ppm ranges.

2. The analog output voltage shall be a 0-1.0 volt D.C. proportional to the selected analyzer range.

3. The lower detectable limit of each analyzer shall be equal to or less than 0.4 ppb.

4. The precision of each analyzer shall be equal to or better than ± 0.5 ppb.

5. The response of each analyzer shall be linear, with an inaccuracy of no more than 0.5% of set point or 2 ppb (whichever is greater) when tested at set points of 80, 40, 20, 10, 8, 6, 4, and 2% of full scale.

6. The span (at 80% of full-scale) response of each analyzer shall not drift more than ± 0.5% of full-scale in 24 hours or more than ±1% in 30 days.

7. The zero response of each analyzer shall not drift more than ±0.5 ppb in 24 hours or more than ± 2% in 30 days.

8. The response time of each analyzer shall be such that the digital display on the front panel and the analog output voltage reach 95% of the final concentration within 300 seconds after the air sample being measured is introduced into the sample inlet port when the 300 second time constant setting is selected.

9. While sampling certified zero air on the 0-1.0 ppm range, the response of each analyzer as measured by the analog output voltage shall not change more than ±1% of full scale when the ambient temperature varies ±10°C from 25°C at a rate of change not to exceed 10°C per hour and the input power voltage varies ±10 volts from 115 VAC.

10. While sampling a constant span concentration of NO at 0.80 ppm on the 0-1.0 ppm range, the analog output voltage shall not change more than ±2% of full-scale when the ambient

temperature changes ±10°C at a rate of change not to exceed 10°C per hour from 25°C and the input supply voltage to each analyzer changes ±10 VAC from 115 VAC.

11. The noise exhibited by each analyzer shall be less than 0.20 ppb when sampling zero air and less than 1% of reading at a span value of 80% of scale (60 second time averaging).

12. Each analyzer shall be equipped with a diagnostic test function which displays analyzer operating parameters on the front panel digital display. The parameters displayed shall include (but not be limited to):

    a. Reaction Chamber Temperature (degrees Celsius(C))
    b. Converter Temperature
    c. Cooler Temperature
    d. Inside Chassis Temperature
    e. Converter Efficiency
    f. Zero Factor
    g. Span Factor
    h. Averaging Time
    i. Reaction chamber pressure
    j. Pump vacuum

13. A change in ambient temperature of 4°C to 44°C shall not cause a permanent change to the zero or span response of each analyzer.

14. Each analyzer shall have the ability to automatically display warning messages on the front panel display. These messages shall include at a minimum, warnings on the parameters listed in the diagnostic requirements in C. 12, above.

15. Each analyzer shall be equipped with a bidirectional RS-232 and an Ethernet communication port to enable the remote control and monitoring of the operation of the analyzer, access to all functions and current NO, NOx, NO_2 concentration data. Access to the analyzer through the RS-232 or Ethernet port shall enable remote control (via a modem, telephone line, and computer) of all the functions of the analyzer available from the front control panel (i.e., all functions and controls available at the front panel shall be available on a computer via the RS-232 or Ethernet port), except the "on-off" power switch function.

16. The software and remote communication capability of each analyzer shall meet the following specifications:
    a. Remote communications functions shall be performed via standard "off the shelf" communications software using standard American Standard Code for Information Interchange (ASCII) formats, such as "Sitcom", "Procomm", "Telcomm", etc. Specifically, communications parameters shall be compatible with the "VT100" terminal emulation protocol. The data format shall be full duplex, asynchronous, 8 bit, 1 stop bit, with no parity.

b. Serial ports shall have selectable baud rates of up to 9600. If baud rates are not manually settable by "dip" switches or jumpers, the system must default to 2400 baud rate.

c. Serial data port connectors shall be 9 pin male "D" connectors, identical to IBM PC/AT, and wired as DTE.

d. Command response strings shall be standard ASCII format terminated with a carriage return. The system shall "echo" commands from the remote terminal and shall provide a "prompt" to the remote terminal operator, indicating the analyzer software is ready for the next command.

e. Remote terminal commands shall be in plain English, i.e., "print", "login", etc., when applicable.

f. The front panel display on each analyzer shall "echo" the terminal display and the terminal display shall "echo" the front panel display.

17. Each analyzer shall operate unattended for periods of up to 12 months. The replacement of external particulate filters is excluded from this requirement.

18. Each analyzer shall be unaffected by normal vibration associated with air monitoring instrument operation and vibration of normal transport.

19. Each analyzer shall not respond to attitude changes up to 45°.

20. The ozone and sample flow rates as displayed on the digital display on the front panel for each analyzer shall be accurate to within ± 5% of the actual flow rate as measured with a certified traceable flow rate standard instrument.

21. The ammonia scrubber in each analyzer shall remove ammonia (NH_3) from the sample stream to eliminate the formation of Ammonium Nitrate on the walls of the reaction chamber and the window to the photo multiplier tube. It shall not interfere with the analysis of oxides of nitrogen by the chemiluminescent process.

22. After a gas mixture containing 1.6 ppm Ammonia (NH_3) in zero air is introduced into the sample stream of each analyzer for a total of 24 hours over three days, the response of each analyzer to a concentration of 0.8 ppm NO shall not decrease more than 1.5%.

23. After a gas mixture containing a concentration of 1.6 ppm NH_3 in zero air is introduced into the sampler stream of each analyzer for 24 hours, the efficiency of the NOx to NO converter shall not be affected.

DGS

ARB
Administrative Requirements
Total Oxides of Nitrogen Analyzer

1. Operating and Service Manuals - Two (2) copies of the operating and service manual shall be provided for each analyzer purchased. Vendor may provide one (1) hard copy of operating and service manual if additional copies are available in electronic format via CD or online. Each manual shall contain installation, operation and maintenance procedures, detailed flow schematics and complete electrical drawings. Each manual shall also contain a complete list of spare parts and recommended spare parts storage levels. The manuals shall give detailed instructions for the use of the delivered analyzers with all options. The manuals shall be of the same quality as required by the U.S. EPA for reference and equivalent analyzers.

2. Shipment - The vendor shall ship the equipment no later than 120 days after receipt of a purchase order.

3. Acceptance Test - Within ten days after equipment delivery, an acceptance test period shall be initiated. The acceptance test period shall consist of checking the equipment for compliance with the requirements listed in bid specification 6620-0119. The duration of the acceptance test shall be 8 days minimum and 60 days maximum.

   If the equipment does not meet the specifications listed, the equipment shall be rejected and the vendor will have one opportunity to repair or replace the equipment to cure all defects. The equipment will be returned to the vendor freight collect. The vendor will have 30 days after the original receiving date or 30 days after being informed of any defect (whichever is later) to deliver acceptable units. The vendor will be responsible for repair of all defects whether or not the defects were declared by the purchaser. After the vendor has repaired or replaced the equipment to eliminate the cause for failure, acceptance testing will again be initiated. Should the equipment again fail to comply with specifications, the equipment will be rejected and the Purchaser may proceed under the General Provisions of the bid and Contract Rights and Remedies of State for default.

4. Payment - Upon presentation of the invoice and after passing the acceptance testing, equipment payment will be made. Any credit for prompt payment will be based on the date of acceptance or the date the invoice is received, whichever is later.

5. Guaranty -The vendor shall provide a written guaranty covering the equipment, including components, parts and field service. The guaranty period shall be for two years and shall begin on the date acceptance testing is successfully completed. In the guaranty, the vendor shall agree to the following conditions:

a. The equipment shall comply with all the specifications listed in bid specification 6620-0119.

b. If failure of the equipment occurs during the guaranty period and application of routine troubleshooting procedures described in the operating and service manual identifies a malfunctioning component or part, the vendor shall ship a replacement component or part at no cost and within 72 hours of notification.

c. In the event equipment develops a malfunction during the guaranty period which cannot be solved by the application of routine troubleshooting procedures described in the operating and service manual or by component or part replacement, the State shall have the option of returning the equipment, at vendor's expense, to the vendor's repair facility. The vendor shall return the repaired, operational equipment to the purchaser within 21 days after the initial date of notification. Should the equipment again fail to meet performance specifications, the State may proceed under the General Provisions of the Bid and Contract Rights' and Remedies of State for default.

d. The vendor shall agree to supply spare parts for the equipment for at least 7 years following the date of acceptance. The vendor shall agree to ship replacement parts to the purchaser within 30 days after receiving a parts order.

e. The vendor shall guarantee all replacement parts to be of equal or superior quality to parts in the original unit.

f. The vendor shall pay for shipment of replacement or defective components, parts, or equipment to and from the vendor's repair station during the applicable guaranty period.

6. Pre-Purchase Inspection - Prior to issue of the purchase order the proposed vendor shall, at the option of the State, deliver to the California Air Resources Board a working unit for inspection and test. The vendor shall have 10 working days to deliver the unit after written request. The unit delivered for inspection shall be the same as the bid unit(s) with all specified options. The pre-purchase inspection shall not exceed 10 working days.

7. Additional Purchase Option - The State shall have the option to purchase one (1) additional analyzer at the bid price at the time the purchase order is issued.